Appl. No. 09/785,999
Amdt. dated September 26, 2003
Reply to Office Action of July 15, 2003

The following Listing of Claims will replace all prior versions, and listings, of claims in the present application:

Listing of Claims:

1. (Previously Presented) A method for making a dielectric structure for dual-damascene applications, the method comprising:

providing a substrate;

fabricating metallization lines within the substrate;

forming a barrier layer over the metallization lines and the substrate;

forming an inorganic dielectric layer to define a via dielectric layer directly over the barrier layer, the inorganic dielectric layer having a dielectric constant of about 4 and being highly selective relative to the barrier layer when etched; and

forming a carbon doped oxide layer to define a trench dielectric layer over and in direct contact with the inorganic dielectric layer, the trench layer being formed to define a metallization line layer.

2. (Previously Presented) A method for making a dielectric structure for dual-damascene applications as recited in claim 1, further comprising:

forming a trench in the carbon doped oxide layer using a first etch chemistry.

3. (Original) A method for making a dielectric structure for dual-damascene applications as recited in claim 2, further comprising:

forming a via in the inorganic dielectric layer using a second etch chemistry, the second etch chemistry being different than the first etch chemistry and the via being within the trench.

G1 Cont.

4. (Original) A method for making a dielectric structure for dual-damascene applications as recited in claim 1, wherein the barrier layer is one of a silicon nitride layer and a silicon carbide layer.

5. (Original) A method for making a dielectric structure for dual-damascene applications as recited in claim 4, wherein the forming of the inorganic dielectric layer includes,

depositing a TEOS silicon dioxide material over the barrier layer.

6. (Previously Presented) A method for making a dielectric structure for dual-damascene applications as recited in claim 5, wherein the carbon doped oxide layer is a low dielectric constant layer having a dielectric constant of about and no greater than 3.0.

7. (Previously Presented) A method for making a dielectric structure for dual-damascene applications as recited in claim 3, wherein the inorganic dielectric layer is one of a TEOS oxide layer and a fluorine doped oxide layer.

8. (Original) A method for making a dielectric structure for dual-damascene applications as recited in claim 7, wherein the first etch chemistry is optimized to etch through the

carbon doped oxide layer and the second etch chemistry is optimized to etch through the TEOS oxide layer or the fluorine doped oxide layer.

G1 Cont.

9. (Original) A method for making a dielectric structure for dual-damascene applications as recited in claim 8, wherein the second etch chemistry is selective to the barrier layer.

10. (Previously Presented) A method for making a multi-layer inter-metal dielectric over a substrate, comprising:

forming a barrier layer over the substrate;

forming a silicon dioxide layer over the barrier layer, the silicon dioxide layer having a dielectric constant of about 4;

forming a carbon doped oxide layer directly over and in direct contact with the silicon dioxide layer;

forming a trench through the carbon doped oxide layer; and

forming a via in the trench extending through the silicon dioxide layer to the barrier layer,

wherein the silicon dioxide layer defines a via layer and the carbon doped oxide layer defines a trench layer for metallization lines.

11. (Original) A method for making a multi-layer inter-metal dielectric over a substrate as recited in claim 10, wherein the barrier layer is one of a silicon nitride layer and a silicon carbide layer.

12. (Original) A method for making a multi-layer inter-metal dielectric over a substrate as recited in claim 11, wherein the forming of the silicon dioxide layer includes,

depositing one of an un-doped TEOS oxide layer and a fluorine doped oxide layer.

G' Cont.

13. (Previously Presented) A method for making a multi-layer inter-metal dielectric over a substrate as recited in claim 12, wherein the carbon doped oxide layer is a low dielectric constant layer having a dielectric constant less than or equal to about 3.0.

14. (Previously Presented) A method for making a multi-layer inter-metal dielectric over a substrate as recited in claim 10, wherein forming the via in the trench extending to the barrier layer further includes,

implementing a first chemistry optimized to etch through the carbon doped oxide layer; and

implementing a second chemistry which is different than the first etch chemistry and is optimized to etch through the silicon dioxide layer.

15. (Original) A method for making a multi-layer inter-metal dielectric over a substrate as recited in claim 14, wherein the second chemistry that is optimized to etch through the silicon dioxide layer is selective to the barrier layer.

16. (Original) A method for making a multi-layer inter-metal dielectric over a substrate as recited in claim 15, wherein the barrier layer is one of a silicon nitride layer and a silicon carbide layer.

G'

17-25. (Canceled)

26. (Original) A method for making a multi-layer intermetal dielectric over a substrate as recited in claim 10, further comprising:

etching the barrier layer; and

forming a via and trench barrier layer to cover a surface within the via and the trench,

wherein the via and trench barrier layer is one of tantalum nitride material and tantalum material.

27-31. (Canceled)